



Fundamentals of NBC Filtration

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Outline

Edgewood Chemical Biological Center

- **Background**
- **Filtration Overview**
- **Short-Term Focus**
- **Plans**
- **Contract Opportunities**
- **Technology Challenges**
- **Summary**



Background

Edgewood Chemical Biological Center

Current Technology

- **Single-Pass Filters (Limited Capacity, Logistics)**
- **Particulate Barrier Filter to Remove Nuclear and Biological Threat Materials**
- **Impregnated Activated Carbon for Chemical Vapor Protection**
- **Integrated into Mask for IP or Environmental Control System for ColPro**



Filtration Overview

Edgewood Chemical Biological Center

- **R&D Thrusts**
 - **Improve Single-Pass Filter Protection**
 - **TIMs**
 - **Novel (Layered) Filter Designs**
 - **Reduce System Footprint**
 - **Improved/Cleanable Particle Filters**
 - **Filter Residual Life Indicators**
 - **Regenerative Filtration**
- **Approach**
 - **Advanced Materials Characterizations**
 - **Laboratory Studies**
 - **Modeling**
 - **Prototype Demonstrations and Integration Studies**
- **Enhanced User Interface**



Short-Term Focus

Edgewood Chemical Biological Center

- **Continue Fundamental Laboratory Studies**
- **Screen Materials with Advantageous Properties**
- **Purposely Design Advanced Materials**
- **Develop Novel Concepts for Integration Optimized to Specific Applications**
- **Demonstrate Lab- and Prototype-Scale**
- **Validate Performance Models**
- **Expand User Interface**
 - **Improved Mask Filters(IP)**
 - **Improved Collective Protection (ColPro)**
 - **Regen**



Contract Opportunities

Edgewood Chemical Biological Center

- **BAA (Tech Base Lab Studies)**
- **R&T Task Order for Program Support**
- **Support to User Procurements**
 - **Future Scout**
 - **JTCOPS, JCPE**
 - **JSGPM**
 - **Comanche**
 - **AAAV**
- **Cooperative R+D**



Technology Challenges

Edgewood Chemical Biological Center

- **Better Adsorbent and Particulate Materials Tailored to Specific Needs**
 - **Smaller Footprint**
 - **Higher Capacity**
 - **Lower Breathing Resistance**
 - **Faster Regeneration**
 - **Better Protection (TIC)**
 - **Regenerability**
- **Novel Designs (e.g., Layered Filter Beds) Tailored to Individual Applications (see above)**



Summary

Edgewood Chemical Biological Center

- **Each Filtration Application is Unique**
- **Current Systems Protect Well Against Conventional WMD Agents**
- **Filter Replacement Should be Reduced or Eliminated**
- **Better Protection is Desired (TIC)**
- **Fundamental Understanding of Filtration Essential**
- **Integration Studies and User Interface Essential**